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ABSTRACT

Beginning in 1976, Regional Colleges were formed in Burma to implement career and technical education at the post-secondary level. This paper describes the Regional Colleges and explores the possible use of a systemic management information process that could assist in the complex planning required to develop second-year vocational and technical classes and third-year work internships. The management information system used by the Hawaii Community Colleges is described as a possible model and is then adapted to a proposed model for Burma Regional Colleges. Major elements in the design include management-level systems outputs, information flow, system software and programming languages to be used, key data elements needed, a data classification scheme, a list of required operating systems, constraints of a planning model, and a plan for implementation. (RT)

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ADVANCED TRAINING IN COMMUNITY COLLEGES FOR FOUR BURMESE UNIVERSITY PROFESSORS

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DESIGNING THE REGIONAL COLLEGE MANAGEMENT INFORMATION SYSTEM

DESIGNING THE REGIONAL COLLEGE MANAGEMENT INFORMATION SYSTEM

A Report Submitted to
The College of Education,
University of Hawaii, Honolulu, Hawaii

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August, 1977

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ACKNOWLEDGEMENT

The thirteen-week observation-study trip to Hawaii, sponsored by the U.S. State Department Educational and Cultural Exchange Program, had enabled our group (of four Burmese educators) to do research concerning the American Community College System. The Management Information System (MIS) within the University of Hawaii System has intrigued me from the standpoint of planning and implementation. Consequently, this paper is but a small attempt to focus on the significance of an MIS as a basis for sound policy formulation and decision-making, which is certainly essential to the tasks of Regional College Planning in Burma. Hopefully, it might contribute towards the development of a system.

In preparing this paper, I am very much thankful to Dr. Teruo Ihara, the Burmese Program Coordinator, who had untiringly arranged our visits and "seminars" with over 50 staff members who are directly or indirectly involved with the Hawaiian Community College System from whom we gained some insights and comprehension. It is impossible to mention them all. But, to them, I am truly grateful for their patience, understanding, and help.

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ABBREVIATIONS

BSPP	Burma Socialist Program Party
CC	Community College
MIS	Management Information System
MSO	Management Systems Office
PPBS	Programming, Planning, and Budgeting System
RC	Regional College
RCMIS	Regional College Management Information System
RCSC	Regional College Supervisory Committee
S/DPC	State/Divisional People's Council
UH	University of Hawaii
UHMIS	University of Hawaii Management Information System

I

DEVELOPMENT OF REGIONAL COLLEGES IN BURMA

By way of introduction, this section presents the main reasons that result in the development of the Regional College System in Burma, the way these colleges were established, and the pattern of its structure designed within the total Burmese educational system.

General Background

The increasing number of enrollments in higher education and the scarcity of job opportunities had led the Burma Socialist Program Party (BSPP) to reassess the educational policies in Burma. Meetings and dialogue were in process since 1974, and the BSPP concluded that the formal education was mainly directed towards university learning and was heavily theoretical, which had no acceptable relationship with the industrial or "work" world. Based on such conclusions, the BSPP then recommended the introduction of vocational-technical oriented training at every level of education within the shortest possible time. To cope with the financial and technical constraints, the BSPP recommended a phased out program of implementation.

The first phase of the plan was to establish two-year, production oriented colleges in all regions (States and Divisions) by the respective State/Divisional People's Councils in the academic year 1977-78.[1] These regional colleges (RCs) would substitute the first two years of the

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[1]The 14 geographical regions of Burma are divided into 7 States and 7 Divisions. Those regions where major ethnic groups dominated are called States after each nationalities, such as Shan State, Kachin State, Araken State, etc., whereas those regions with predominently Burmese population are called Division after the geographical regions, such as Irrawaddy Division, Rangoon Division, Mandalay Division, etc.

university education of higher learning. By this arrangement, the matriculated students of each region will enroll in the RC within his State/Division instead of enrolling in the universities and institutes which are mainly situated in the big cities. This "higher-level first" approach was, as mentioned earlier, designed to meet financial and technical restrictions in restructuring the educational system. The approach was comparatively feasible for implementation as the enrollment at the Regional College level would normally be much less than the enrollment at any level in the basic (secondary) education.[2]

Establishment of the RCs in Burma

In line with the BSPP's recommendations, the Ministry of Education, in 1976, in conjunction with the Management and Social Affairs Subcommittee of the Council of Ministers, launched a program of implementation to open up production oriented RCs in various States/Divisions.

The major objectives of the RCs are:

1. To give the students opportunities to be engaged in production and gain job experience while studying in the RC.
2. To prepare the students for successful job entry and for eventual employment in supervisory level in various industries.
3. To encourage students of higher intellectual caliber and diligence to pursue higher learning in Universities and Institutes.

Since the RCs would be operated by the State/Divisional People's Councils, and not be the Ministry of Education, the burden of administrative responsibilities is virtually shifted to the regional authorities.

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[2] The school system in Burma is 5-4-2. The primary school level is from KG to grade 4, the middle school level is from grade 5 to 8, and the high school level from grade 9 to 10. Each level terminates with the nationally held standardized examinations. Unsuccessful students can repeat the year's work for any number of times, but enrollment is permitted for two consecutive years only.

In other words, the decentralization of education administration was made authentic for the first time in the history of modern Burma. By and large, the State/Divisional People's Councils (S/DPC) were eager to bear the burden as it would directly contribute to regional development and endow them with autonomous status. However, they greatly lack the experience in education administration. Strong effort is made, therefore, by the Ministry of Education to assist the S/DPCs in every possible way in establishing the RCs. Specifically, the education ministry took charge of the academic responsibilities such as coordinating the standards in course and curriculum development and the vocational and technical teacher training.[3] The S/DPCs would be responsible for securing buildings, equipment, and manpower, and doing general administration. Public support had already shown in the form of land and cash donations, and in some cases, the construction plans for the new RC buildings were already underway. For the 1977-78 academic year, one or two state high schools from each State/Division would be transformed into RCs on a temporary basis. In some regions where both the two-year and four-year colleges exist, facilities were to be provided either on a part-time or a full-time basis. Consequently, the education ministry assisted in securing the interim facility for the initial stage of the RC development.

As the RC plan was a part of the nation-wide education reform, all the directorates under the Ministry of Education made all-out effort in taking part in its implementation. Moreover, other ministries such as Industry, Transport and Communications, Mines, Cooperatives, etc. began

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[3]Dr. Lawrence F. H. Zane and Professor John W. Rantala of the University of Hawaii, College of Education visited Burma for five weeks in December-January, 1976-77, and made specific recommendations for the development of a national training center for RC instructors among others.

to get involved themselves in the RC plan under the guidance of Management and Social Affairs Subcommittee of the Council of Ministers.

Structure of the RCs

Beginning the academic year 1977-78, a matriculated student would have two options to pursue higher education. One is to enroll in the RC within the region he lives, and the other is to enroll in the University Correspondence Course.

Curriculum offerings in the first year of the RC are made up of four clusters of basic arts and science subjects as follows:

1. Science cluster with mathematics
2. Science cluster with biology
3. Arts cluster with mathematics, and
4. Arts cluster without mathematics

Students who are successful in the first year could go over to second year where he is to specialize in one "technology". Each RC will offer all four options in the first year, but may offer selective technologies in the second year depending on the region's need and resources available

Diplomas will be awarded to successful candidates at the end of the two-year program of the RC. By then, the graduates of the RC would have a choice of two tracks to follow. One is to begin a job and the other is to pursue university education. Those who desire to begin a job would go through a one-year on-the-job training program sponsored by the RC. In this program, the trainees would be put into a cooperative program with the industry, or assigned to the RC operated small shops or farms, or would be put on any other job-experience training program arranged by the RC. If successful in the program, the trainees would be awarded with certificates. Others wishing to earn a University degree may attend the institution of their choice by going through entrance examinations.

Graduates of the RC may take university entrance examinations any number of times. Those who have completed on-the-job training programs may also take the entrance examinations.

The development of the RC system in Burma is just in its beginning by AY1977-78 with its newly opened first year classes in some 17 RCs in 12 regions. (Two regions, Chin and Kayah States, are not prepared to open the colleges in AY1977-78.) There is a tremendous lot of work to be done in planning for the second year vocational and technical classes, and an additional year of on-the-job training. These phases of planning are complex and challenging. One must allocate the available resources of time, manpower, techniques, and funds to implement the plan successfully. For this, one should base on current and timely information in making his decisions. Hence, the need arises for a systemic process for management information.

II

NEED FOR A SYSTEMIC MANAGEMENT INFORMATION PROCESS IN STRATEGIC AND ADMINISTRATIVE PLANNING

In this section, the Management Information System is viewed as a tool for planning and evaluation. The purpose of the Regional College Management Information System is also defined.

Management Information System as a Tool of Planning

The necessity of a reliable data system cannot be over-emphasized in the successful planning and implementation of the RC program. Higher education agencies in general do not pay enough attention to "planning" as in industry and business. In Burma, there had not been a planning section in education until 1975. As planning was a neglected operation, recommendations made in seminars and meetings did not bring changes that were important enough to have an impact on education. So situations remained the same while the economy demanded new needs in manpower development. The gap between recognizing the need for better planning and programming and specific solutions should be made narrower if not completely bridged. Thus, a management information system would be a very basic and useful tool to have.

Concisely stated, there is a great need for an improvisation of a Regional College Management Information System (RCMIS) if the RC program is to develop successfully. The constraints of time, costs, and techniques are so immense that a more systematic and economical approach in planning is much desirable. If some kind of a RCMIS could be built into a total system of education there is an excellent chance that the plans and programs could be implemented successfully to meet the needs of the society. Moreover, the involvement of the different ministries, people's

councils, and departments, intensify the communication process calling for more systematic collection of data and analysis.

Within the complex of organizations it is most important to gather and supply the right kind of information. Only then will the tasks of planning and implementation be done effectively without duplication and waste. However, one must bear in mind that like any tool, the RCMIS could be properly used or badly abused.

Purpose of the RCMIS

The need for a systemic management information process could be spelled out by identifying its specific purposes. The main purpose of the RCMIS is to serve in the following areas:

1. Strategic planning and policy formulation
2. Administrative planning
3. Evaluation

Strategic planning includes specifying goals, and policy formulation is a process of setting general statements that guide decision-making. Strategic planning is not to be left entirely with the higher echelons but should be done also by the clients and constituents of RC education. For example, when the directors, rectors, professors, and lecturers became involved in various sub-committee for RC development, each sub-committee went through the following steps in their deliberations:

1. Problem identitication
2. Knowledge exploration
3. Priority setting
4. Program development

The participation of the different levels of organizations in strategic planning is the strength of the RC development plan. Therefore, the RCMIS could very well be a support system for successful implementation of the RC program. This in turn will help the higher echelons in formulating clear-cut policies and guidelines.

Administrative planning deals with the development of operational plans that guide the RC system in the use of resources so that the goals of the system are accomplished. Basic management information will always be needed in developing operational plans and programs. Besides, resource allocation decisions must be made within the limited time span for the plans and programs to be efficiently operational.

As a tool of evaluation, the RCMIS will be a logical base for any program review.

Before going into the designing of the RCMIS, we shall briefly take a look at the University of Hawaii Management Information System to have an idea of its functions and role.

III

A GLIMPSE INTO THE HAWAIIAN COMMUNITY COLLEGE MANAGEMENT INFORMATION SYSTEM

In this section, the University of Hawaii Management Information System is summarized, the kinds of reports that the System produces is traced, and its relationship with the planning function is described.

Systems Organization

The seven community colleges of Hawaii, scattered on four islands, are coordinated by the Community College Systems Office situated at the University of Hawaii-Manoa campus on Oahu. Since the University of Hawaii (UH) System encompasses the community college system and the universities at Manoa and Hilo, plus West Oahu College, the Management Systems Office (MSO) is the central information coordinating body for the total university system. In this section we shall deal only with the community college sub-system's information process.

The Hawaiian Community College System is administered by the Office of the Chancellor which plans, directs, and coordinates the development of operation of the community colleges (CC), the Hoomana School, and the State Manpower Training Office. The CC Chancellor's office coordinates program plans with the office of the UH Chancellor and assists the total university system to develop policies which affect all colleges.

One of the major functional departments of the Hawaiian CC Systems Office is Education Support Services. Educational Support Services' main functions are as follows:

- Collects and analyzes student and faculty information data for planning purposes
- Prepares research reports to assist the CC Chancellor's office and each CC to plan and program activities

- Maintains computerized student and faculty information service systems
- Controls and maintains file on courses offered throughout the system
- Provides basic data for planning staff on CC activities

Figure 1 shows the position of Educational Support Services within the UH Management Information System.

Institutional Research Reports

Educational Support Services produces a number of institutional research reports which cover three major areas of information. They are:

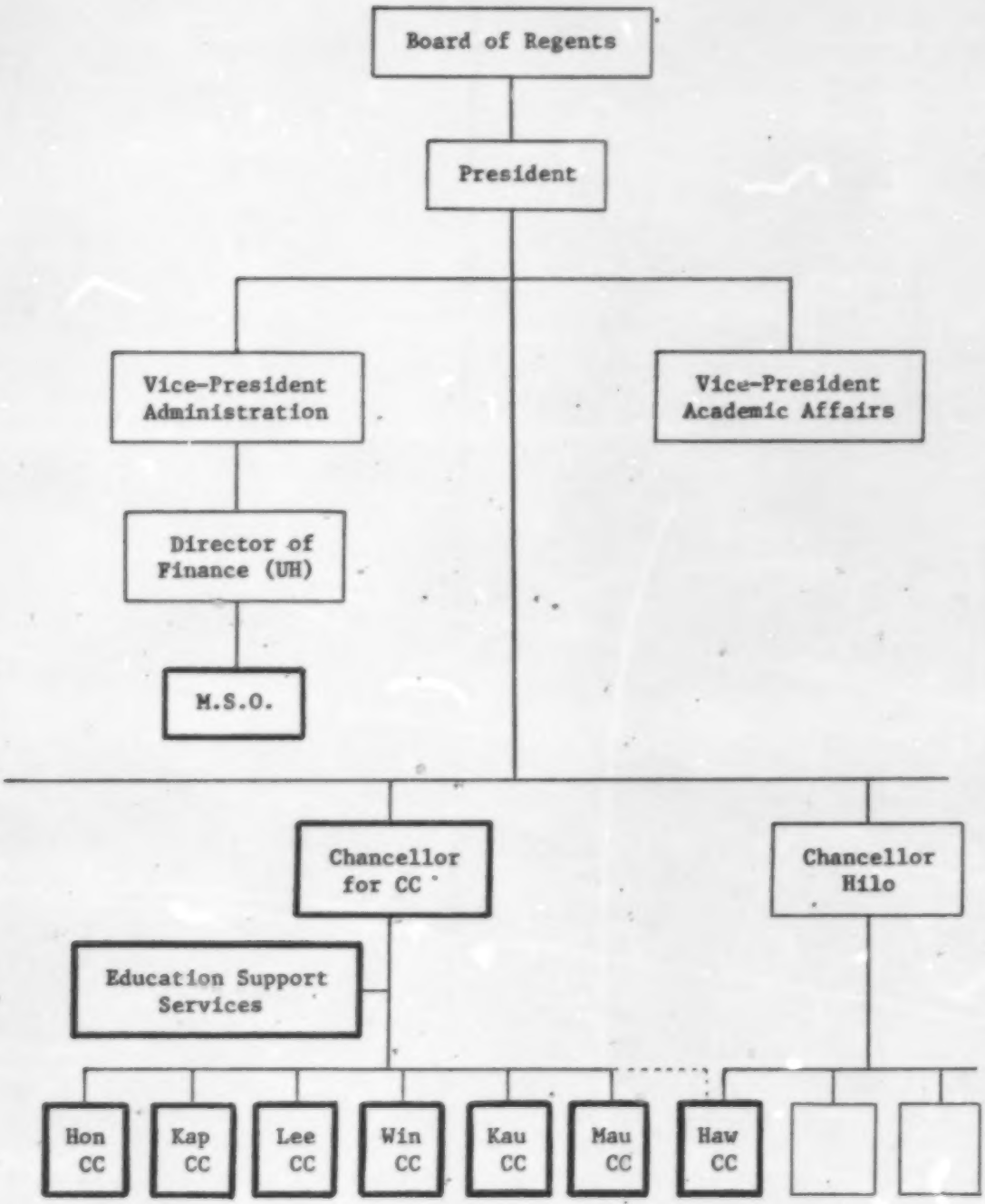
1. Student information, including:
   - High school background of freshmen
   - Transfers to the community colleges
   - Enrollment projections and head (and FTE) count of students
   - Multiple registrations
   - Summer sessions
   - Student characteristics
   - Unclassified and special students
   - Distribution of student majors
   - Local addresses of the CC students
   - CC non-continuers and withdrawals
   - Transfers to Manoa campus and Hilo campus
2. Instructor information, including:
   - Selected characteristics of full time professional staff
   - Faculty teaching load, and
3. Academic program information, including:
   - Academic cross-over reports
   - Final grade distributions
   - Course equivalencies in general education and vocational education

The above reports come out every semester, every year, or every two years as the case may be. There are to date some 102 reports since the inception of the program in 1967.

The above-mentioned reports are processed by the Education Support Services of the Office of the CC Chancellor and all of them are related

Figure 1

PARTIAL ORGANIZATION CHART SHOWING POSITIONS OF INVOLVEMENT
IN MIS FOR COMMUNITY COLLEGES
(Shown by thick lines)



to the CC system only. Likewise, there are three other information processing centers at the offices of the Chancellors of Manoa, Hilo, and West Oahu. Reports by these four separate sources are integrated at the UH system level at the MSO. Therefore, the CC information system described is actually a sub-system of the UHMIS.

University of Hawaii Management Information System (UHMIS)

The MSO of UH has five major projects. They are:

1. Student information system
2. Fiscal information system
3. Faculty and staff information system
4. Physical facilities information system, and
5. Course information system

At the operational level, the CC gathers the management information components in each of the above-mentioned areas. This information is then processed at the systems level by the Educational Support Services of the Office of the CC Chancellor. The CC system level information together with other information from UH-Manoa, UH-Hilo, and West Oahu are integrated into the total UH-system level at the MSO. The institutional level and the UH level could be reckoned as two different stages of the UHMIS, although each level serves for a different purpose. However, the reports produced at both levels give direct service to the planners and administrators concerned.

Attempts are being made to have an "integrated management information system" whereby a cut-across or horizontal information might be provided to the management personnel. For example, class information could be provided together with related information on faculty, courses, and cost, simultaneously. In other words, information can be analyzed not only vertically, such as student information or faculty information, but also horizontally, such as student information with related faculty information, fiscal information, etc.

UHMIS and Planning

The UHMIS is involved in a complex administration of concepts, paper work, computer analysis, and service responsibilities. In an education system where the student is clearly the focal point, a support system like the UHMIS creates a heavy workload of planning and implementation for those who are participating in such an endeavor.

The users of the UHMIS range from state level and UH level management personnel to the CC or college level management personnel. The State Board for Vocational Education and the State Post-Secondary Education Commission are examples of the state level users who must utilize such system output information in drawing up their master and five-year plans. The UH level users, for example, are the director of academic program and the director of long range planning. The Chancellor-level and college level planners are near-operational and operational level personnel who could actually and "consciously" change or implement the course of Hawaii's higher education if they could make the proper "use" of the information generated. The use of the systems output is the criteria for the further development of the UHMIS and obvious steps have been taken to review it via feedback systems.

With this background of UHMIS, we shall attempt to present a conceptual design of the Regional College Management Information System that could be developed in Burma.

IV

DESIGN PROPOSAL FOR A REGIONAL COLLEGE MANAGEMENT INFORMATION CENTER IN BURMA

In this section, the systems approach to planning Regional Colleges is introduced. With the brief description of a theoretical model, design proposal is presented for the RCMIS at length.

The Task of RC Planning and the Systems Approach

Until recently, educators and practitioners of higher education throughout the world seemed to reject the idea of planning. This denied education systems the skills necessary to perform their proper function, thus the situation generally turned into serious crises of coping with organizational survival rather than moving towards growth and progress.

With the educational policy of Burma set towards production orientation, the strategic planning, academic planning, and administrative planning should initiate a new methodology in meeting educational objectives.

Planning cannot be separated from program review, and budgeting involves both. The three activities suggested by these functions are reflected in the popularity of Programming, Planning, and Budgeting System (PPBS) in most institutions. Thus, whenever we talk about planning there is an implicit involvement in program review and budgeting as well.

One of the techniques that somewhat bind these functions together is the 'systems approach'. The systems approach to management has reached into the realm of education within the past few years.

The underlying premise of a systems approach is to think of planning as a whole process rather than just a series of events. Such a

process is perceived as comprised of many interacting elements whose behavior is always related with the entire system. The basic elements of any system can be described as:

1. Input - anything taken into the system
2. Output - anything generated outward from the system
3. Processors - mechanisms that convert input to output
4. Feedback - output resulting from past decisions used as input to alter the existing state
5. Environment - external surroundings or circumstances that may influence inputs, the process itself, output, or feedback.

These elements are depicted in Figure 2.

Theoretical Framework

In the development of the systems model in planning the RC education system, the following sub-systems should be identified:

1. Strategic planning system
2. Academic planning system
3. Capital and facility planning system
4. Budget system
5. Decision-making support system
6. Management information system, and
7. Evaluation system

The strategic planning (and policy formulation) system included the functions of specifying goals and setting general statements for guiding decision-making in RC planning and implementing work. (See Figure 3.)

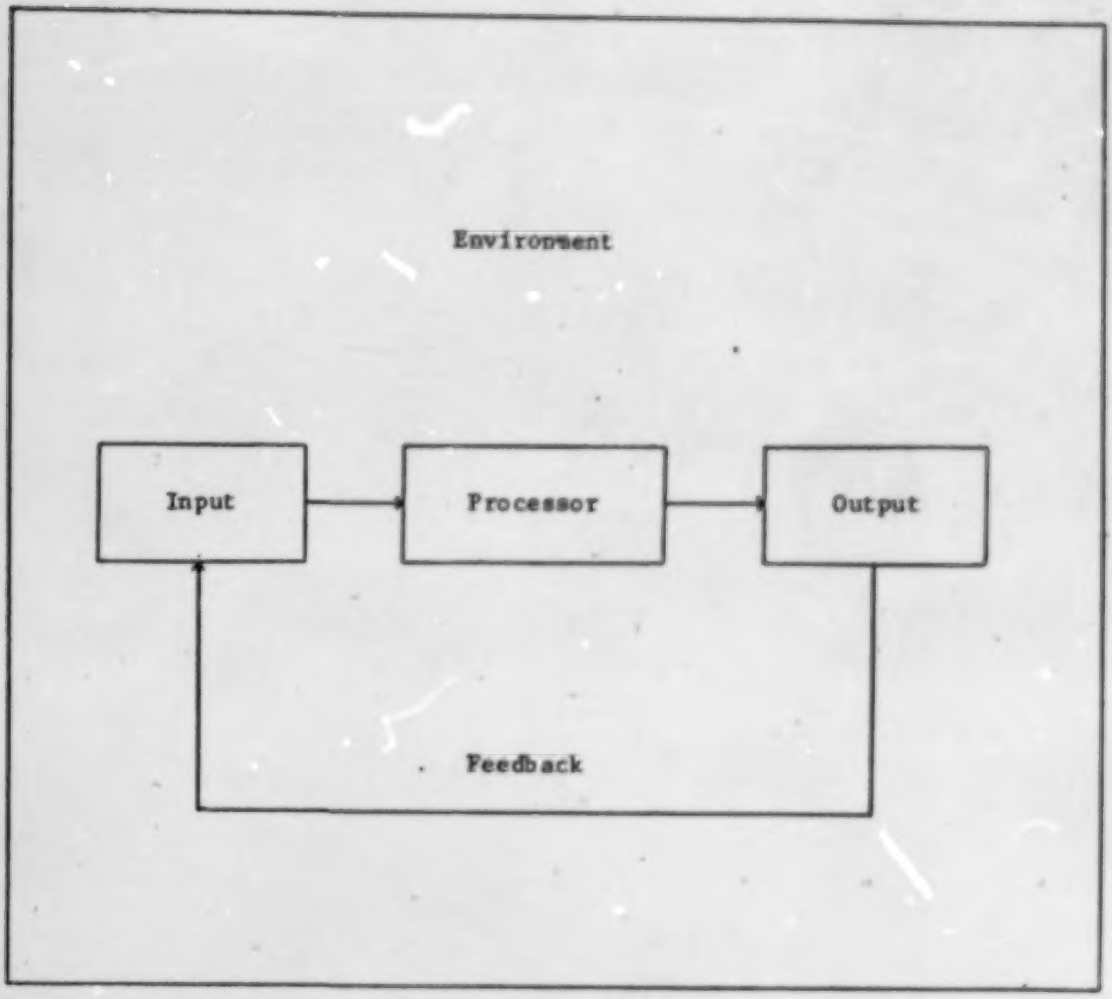
The academic planning system consists of student enrollment, curriculum development, course proposals, faculty development, etc.

The chief function of the capital and facility planning system is to allocate resources efficiently after a careful study of needs.

The budget system is the one which reflect the results of the other systems, It would therefore act as a control device to see if the funds were assigned where they are needed. Any changes in policy, academic, and capital planning would show in the budget and would indicate whether the

Figure 2

BASIC ELEMENTS OF A SYSTEM



plan is implemented or not.

In the decision-making support system, the nature of problems to be solved or decisions to be made would dictate the analytical technique to be used. Techniques such as linear programming, simulation, statistical analysis, and heuristic models are normally the tools used in this system. The application of these techniques in the Burmese situation would be a modest one, at least at the initial stage.

The main purpose of management information system (MIS) is to provide information that is accurate, relevant, and timely. This information is then to be used by administrators to make decisions and plans. We shall present a design proposal for a regional college management information system (RCMIS) in the following sub-topical paragraphs.

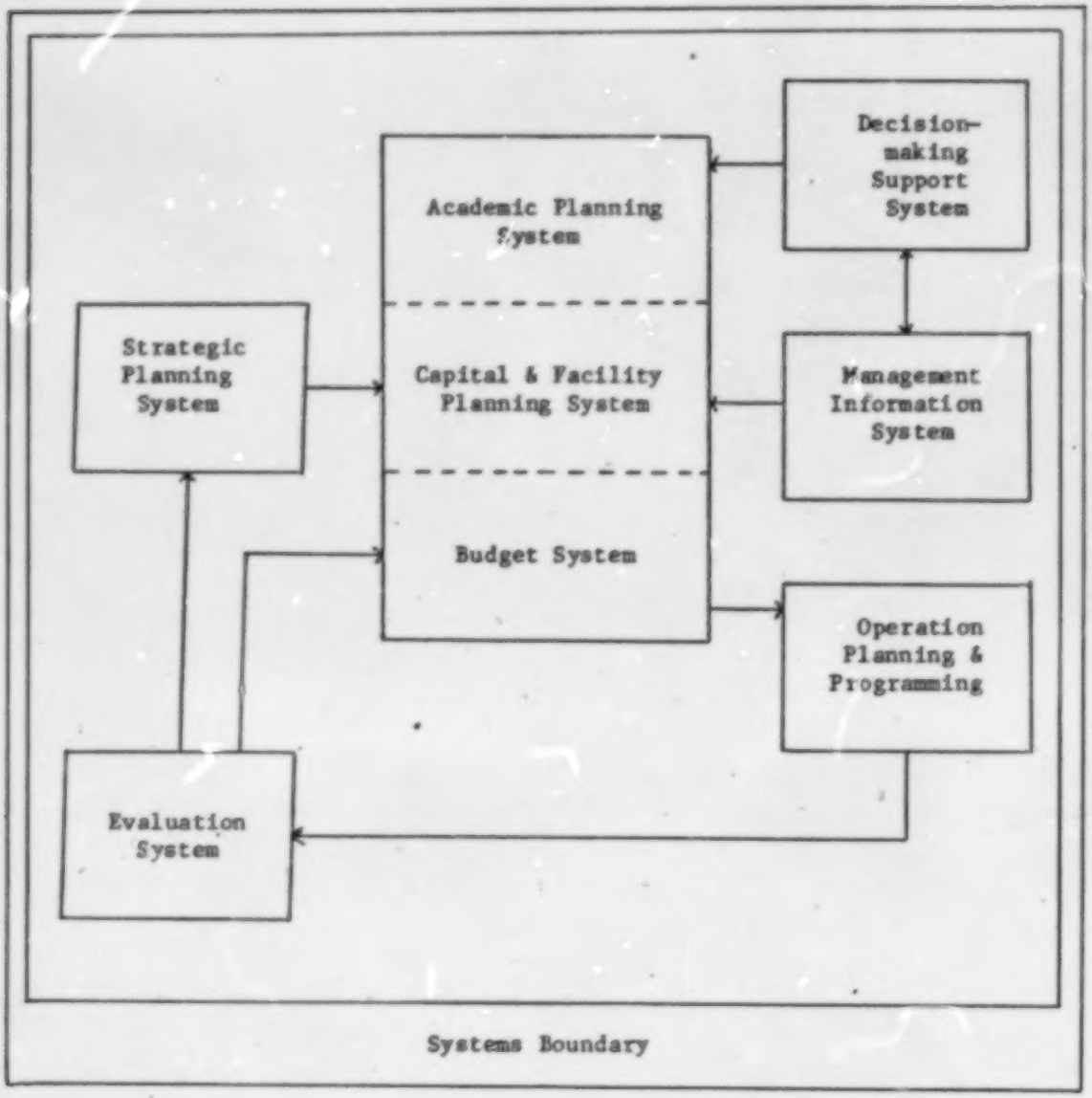
When operational plans and programs were made with the help of MIS, the actual implementation should be measured if it meets the goals and objectives. In this way the MIS feeds back the results to be analyzed by the evaluation system. Program reviews and evaluation could be in many forms, but considerations must be made that there is more than one measure of effectiveness. Whatever the measure is it should reflect the goals of the total educational system. As the needs to be met by the RC would not be constant over time, the evaluation system should provide directions or guidelines rather than comments.

Environment for Developing the RCMIS

As mentioned earlier, the RCs are at present administered by the S/DPC who are responsible for physical and financial planning. The academic planning part would be controlled by the Ministry of Education. Currently, the principal (provost), the registrar, and heads of the departments are on the education budget. But the remainder of the

Figure 3

SYSTEMS MODEL FOR RC PLANNING



teaching and non-teaching staff are to be hired and remunerated by the S/DPC. This is only an interim staffing measure prior to the S/DPC taking charge of the entire staffing process. To establish the administration of the RC, the S/DPCs have formed the Regional College Supervisory Committee (RCSC) in each region of the country. Therefore, the principal of the RC is responsible to the RCSC.

The three directorates under the Ministry of Education and the schools, institutes, and universities are directly or indirectly related to the operation of the RCs. Furthermore, other ministries such as industry, transport and communications, mines, etc., as indicated in the first chapter, take responsibilities in assisting the programs of the RC.

These organizations and departments form the environment within which the RC is to be operated. They would naturally be the main users of the information processed by the RCMIS. Figure 4 shows the framework of the environment.

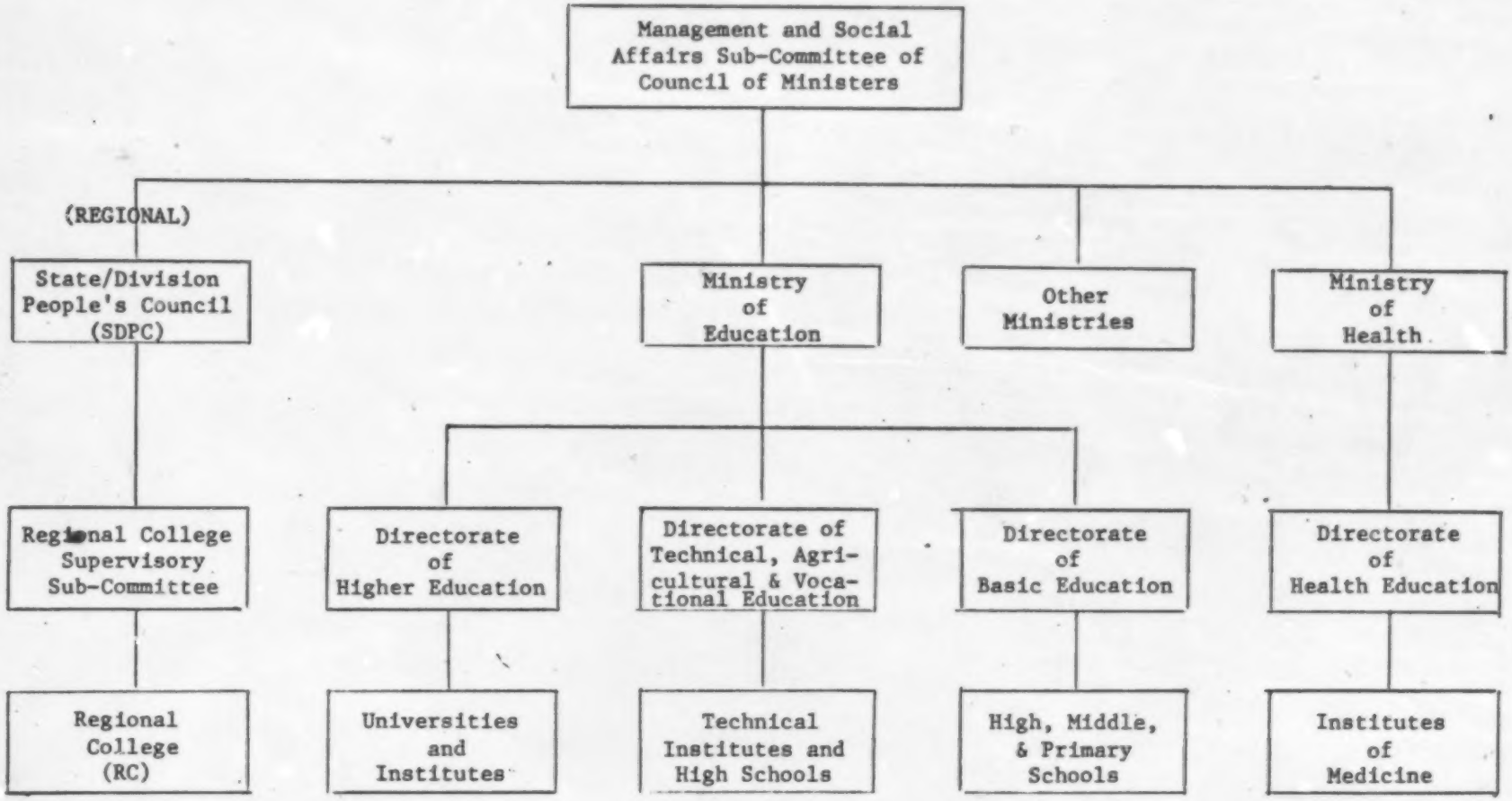
Model for RCMIS

The basics of a RCMIS should include men, machines, and methods which would support the RC administration in the collection, classification, storage, and retrieval of data needed for managing. It is to serve as a link between the planning and controlling functions of management and the day-to-day operating procedures.

It should be noted that an operating system is different from the RCMIS itself. Operating systems are those which use detailed data (manual or automated) to support the on-going operation of a RC. Operating systems, therefore, deal with transactions concerning single individual units or events and maintaining records on that basis. The outputs of the

Figure 4

FRAMEWORK OF ENVIRONMENT FOR RCMIS


Management and Social Affairs Sub-Committee of Council of Ministers
(REGIONAL)
State/Division People's Council (SDPC)
Ministry of Education
Other Ministries
Ministry of Health
Regional College Supervisory Sub-Committee
Directorate of Higher Education
Directorate of Technical, Agricultural & Vocational Education
Directorate of Basic Education
Directorate of Health Education
Regional College (RC)
Universities and Institutes
Technical Institutes and High Schools
High, Middle, & Primary Schools
Institutes of Medicine

operating systems are operational in nature, such as student enrollment, payroll, etc., rather than purely informative, and are used on a day-to-day or week-to-week basis. In short, the operation systems operate independently of the other systems.

The RCMIS data would tend to be aggregative in nature and is updated and used less frequently than operating systems data. The balance sheet, a space utilization summary, and a forecast of faculty requirements would be typical RCMIS reports. The link between the operating systems and the RCMIS is the former's master files. These must be created and maintained at the detail level before the RCMIS system can be made operational. The diagram in Figure 5 shows the location of RCMIS in relation to operating systems on one hand and the planning process on the other.

Structure of RCMIS

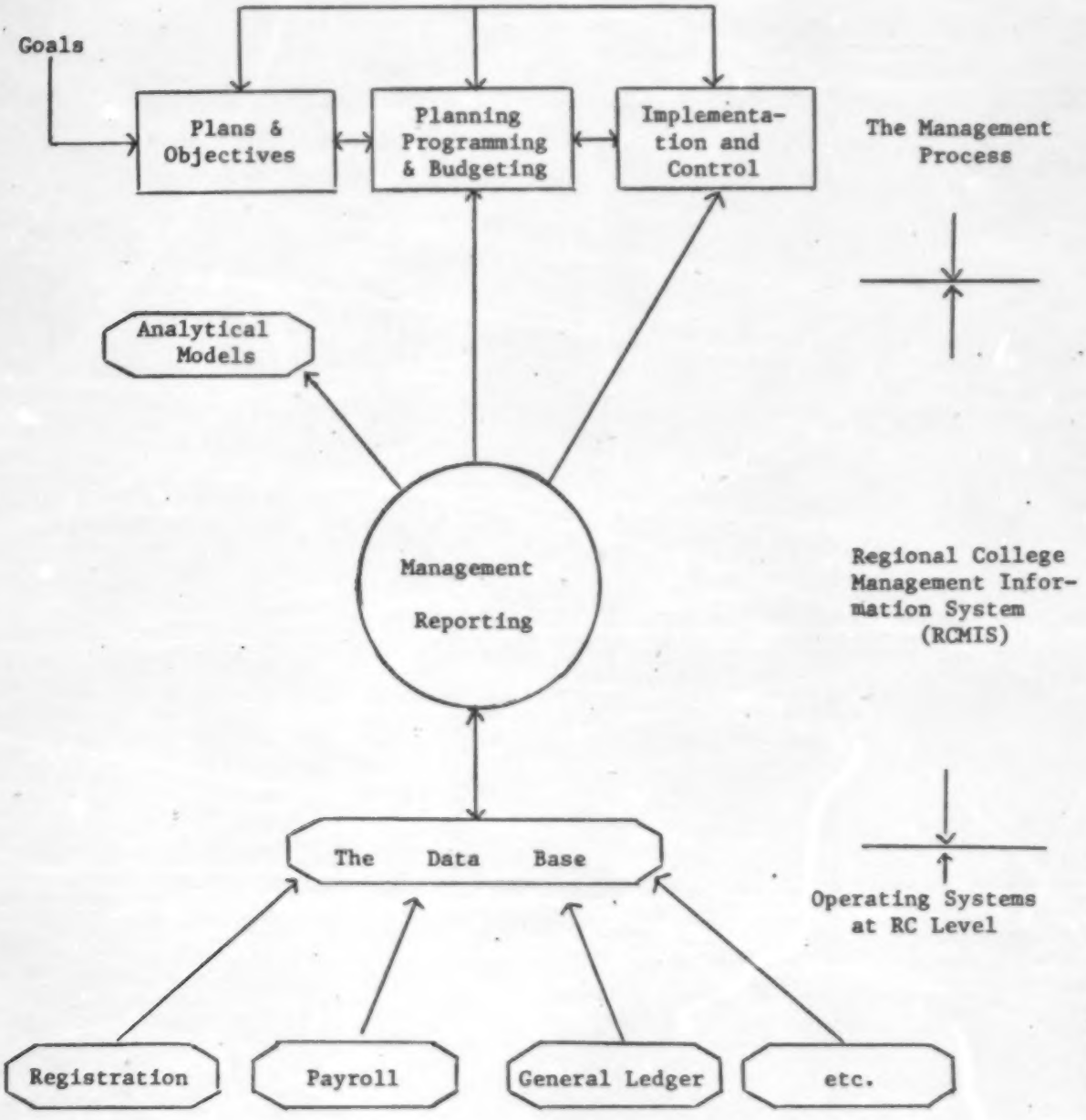
It is absolutely essential to develop an overall understanding of the interrelationship of such operating functions as registration, space allocation, staffing and course scheduling, and unit costs. Then only the strategic planning and administrative planning would be objective. For that purpose, the design proposal of the RCMIS should fulfill the fundamental requirement to include the major elements of a MIS.

The major elements in the design proposal of RCMIS are the management-level systems outputs, information flow, system software and programming languages to be used, the key data elements needed, a data classification scheme, a list of required operating systems, constraints of a planning model, and a plan for implementation.

1. Systems Outputs: The systems outputs should consist of a set of reports designed to serve management needs at various points in the management process. Each report should be designed to

Figure 5

DIAGRAM SHOWING THE LOCATION OF
RCMIS IN RELATION TO OPERATING SYSTEMS
AND THE PLANNING PROCESS



include a definition of each of the fields contained in the report and statements as to the purpose of the report, how it will be used, and frequency and manner of distribution. When the required reporting structure is defined within the framework of its objectives, say for planning or for operating information, data elements needed to produce those reports must be identified. These could be grouped in file structures that should adapt to the master files of the operating systems. For example, the systems outputs useful for the management of RC at all levels could be classified as follows:

a. Student Information
b. Faculty Information
c. Academic Program Information

It is suggested that RCMIS outputs should be developed and controlled in manageable segments. The output format could be easily devised by tying it in with the needs of the users. At the initial stage, information should include basic statistics such as follows:

a. Student Information
   - enrollment
   - characteristics
   - distribution of students by subjects and technologies

b. Faculty Information
   - characteristics
   - teaching load

c. Academic Program Information
   - course equivalencies

We shall not dwell on the format design for each output information mentioned above as time and space do not permit.

2. Information Flow, System Software, and Programming Languages: The information flow description could be made in a system of flow charts with brief explanation. The flow chart should show how data elements will be handled from the point they originate in the machine to the point where they are produced as various systems outputs. It is important, at this point, to identify the major operating systems master file structures and major operating systems file update runs. Then only it would be possible to show how data is gathered by the operating system and how it flows from one operating system to another.

When systems outputs and the information flow chart have been designed, it should be possible for the system designer to prepare overall specifications for the operating software required by RCMIS. The University Computer Center at Thamaing College campus in Rangoon has facilities for designing the executive system, the type of file management software to be used, the requirements for inquiry, and the basic programming languages capable with their ICL-1902 computer.

3. Data Classification Scheme and Operating System: A data classification could be worked out to permit input transactions to be coded so that individual data elements can follow the information flow path to be finally summarized in management reports.

The RCs in Burma have been set up and are operating during the academic year 1977-78. It is now time to develop a list of operating systems to support the management reporting system. Such a list would include the name and basic functions, frequency of operations, total estimate of time and effort required to make

it operational, if applicable, and priority for implementation in the light of needs and available resources.

4. Planning Model: A planning mode should be developed to provide an analytical description of meaningful relationships among program activity levels and resources under varying circumstances. With the aid of computers, demands on each resource can be computed rapidly for each program of activities and policy constraints.

   With initial planning data, the model can function to provide the administrators of the RC system with enrollment projections, staffing, faculty requirements, facility requirements, etc.

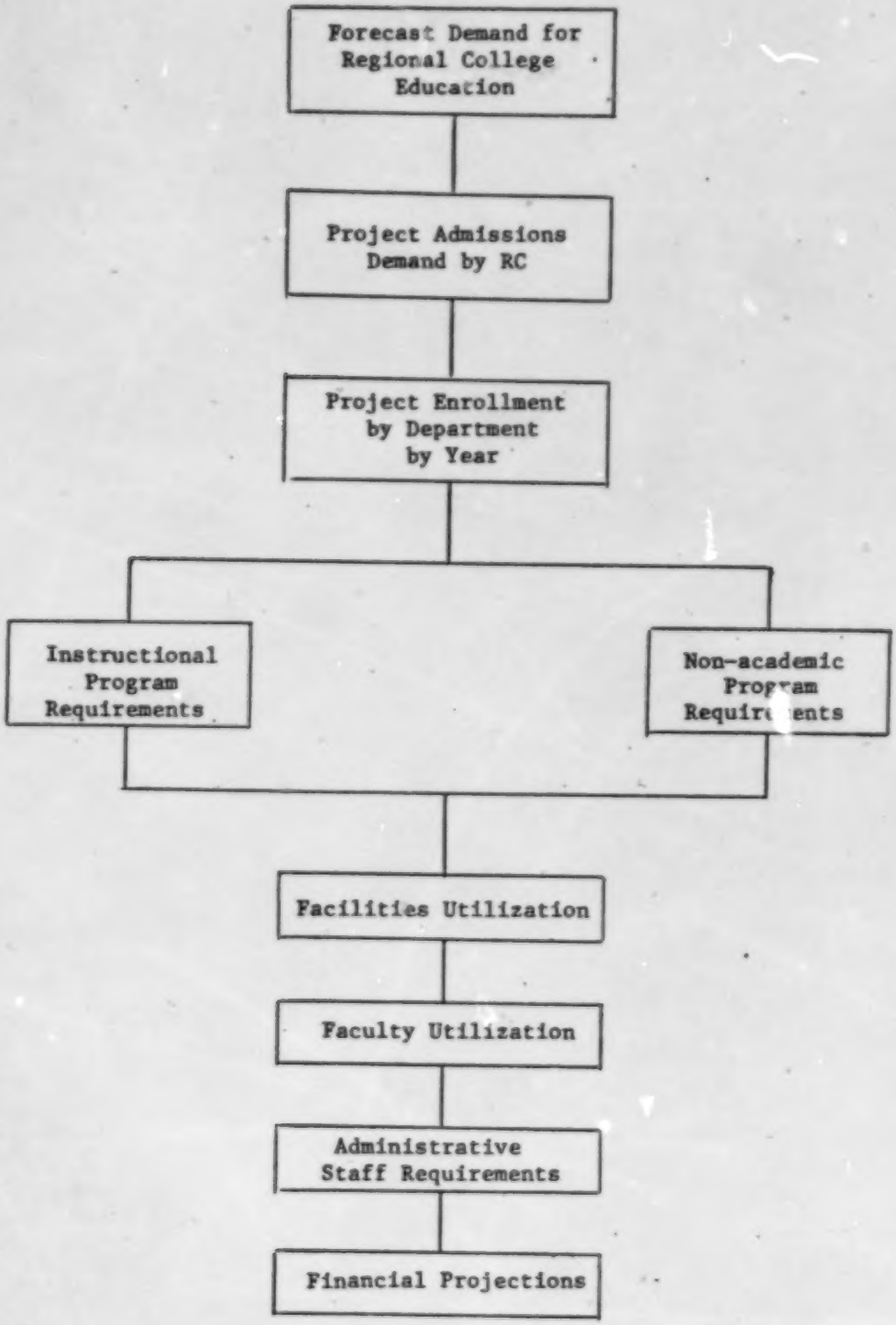
   A general description of the planning model in modular form is provided in Figure 6 for a structure approximately the size of a typical RC in Burma. Such a model could be developed more thoroughly in stages to be consistent with the available data.

5. Implementation Plan: After the above mentioned data have been developed with the approximations for the management reporting system and the software designed, an implementation plan should be prepared for management approval. The plan should include:

   - Overall time frame for implementation of the RCMIS, and the completion dates for each sub-system.
   - Points of control, review, and approval. Consideration should be given for flexibility to make changes and adjustments without undue disruptions at each point, depending upon overall conditions at that time.
   - Priority schedule for implementation of individual operating sub-systems.
   - Estimates of resources required for implementation. For example, manpower needs, management participation, computer time, etc., must be planned in advance.

Figure 6

PLANNING MODEL



Once a conceptual model as presented in this paper has been established, it is possible to proceed with the design and implementation of the individual operating systems with reasonable confidence that they will fit into the eventual RCMIS framework.

Anticipated Problems and Possible Solutions

Perhaps the single greatest potential pitfall for an information system is a user motivation. The user of the systems output and the people supplying raw data must be properly motivated. Otherwise, the system will fail no matter how well designed. For this matter, the system should be designed in such a way to aid in that motivation. This could be done with the participation of top management of the RC system and selection of the right persons to implement the RCMIS.

The second possible problem is to produce the systems output that are tangible in time. Even at the early stage of development, senior managements, especially the funding or sponsoring agencies, will be anxious to see the results. This could be achieved by phasing the projects of the RCMIS with priority schedule for implementation. This way, it serves both parties and adds to the success of the system.

The third problem anticipated is that the enthusiasm of the system designer could lead to a sophistication of design in trying to meet the expectations of the intended users. This could lead to mote complications in a system which already has a complex nature. Perhaps the simple approach could be utilized by users and systems personnel to alleviate the problem. The chance of realizing a successful RCMIS depends on the extent that simplicity can be achieved.

The final point of danger is that the system could turn out to be efficient in producing repetitive information resisting change. As it is

the nature of management to change, (or it would not be management) management needs will be changing. Thus, management would have new requirements for information system. To accommodate this, a flexible design is of paramount importance. We should not try to achieve an optimal system at the outset. The system design should be an iterative process in which the results of earlier experience are built upon to improve the capabilities of the RCMIS.

In conclusion, the success of the RC system depends on management decisions, and management decisions must be based on facts and meaningful information, the processing of which, is the task of RCMIS. It is therefore, a most desirable prerequisite that top management should get involved in participating in the designing of the RCMIS.

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